25(1) PHASE I BOOK EXPLOITATION SOV/1621

Kukhtarov, Vladimir Ivanovich

Stoykost' shtampov dlya kholodnoy listovoy shtampovki (Service Life of Dies Used for Cold Pressing of Sheet Materials) Moscow, Mashgiz, 1958. 88 p. 7,000 copies printed.

Ed.: S.I. Yefremov, Engineer; Ed. of Publishing House: G.N. Soboleva; Tech. Ed.: A.F. Uvarova; Managing Ed. for Literature on Heavy Machine Building: S.Ya. Golovin, Engineer.

PURPOSE: The book is intended for design engineers, technologists, and foremen engaged in sheet metal work.

COVERAGE: The author discusses various factors which affect the service life of dies used for sheet metal work. Special die design features are explained and illustrated which increase the useful life of the equipment. Organization of die maintenance service to provide for efficient utilization and repair of equipment is described. No personalities are mentioned. There are 14 Soviet references.

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AVAILABLE: Library of Congress (TS250. K8)

GO/sfm
6-2-59

YEFREMOV, S.I.; KUKHTAROV, V.I., inzh., red.; SIROTIN, A.I., inzh.,
red.izd-va; SMIRNOVA, G.V., tekhn.red.

[Hard alloy inserts in dies] Tverdye splavy v shtampakh.
Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959.
35 p. (MIRA 12:9)

(Dies (Metalworking))

KUKHTAROV, V.I.

Characteristics of the workability of cold forged parts.
Kuz.-shtam.proisv. 1 no.7:6-10 Jl '59. (MIRA 12:10)
(Forging)

KUKHTAROV, V.I.

Manufacture of truck door hinges from rolled shapes. Kuz.-shtam. proizv. 1 no.8:44-45 Ag '59. (MIRA 12:12)
(Sheet-metal work)

PHASE I BOOK EXPLOITATION SOV/4572

Kukhtarov, Vladimir Ivanovich, and Oleg Vladimirovich Kukhtarov

Shtampy dlya kholodnoy listovoy shtampovki (Dies for Cold Stamping) Moscow, Mashgiz, 1960. 320 p. 8,000 copies printed.

Reviewer: A.D. Tomlenov, Doctor of Technical Sciences; Ed.: B.P. Zvorono, Candidate of Technical Sciences; Managing Ed. for Literature on Heavy Machine Building (Mashgiz): S. Ya. Golovin, Engineer; Ed. of Publishing House: L.A. Osipova; Tech. Ed.: B.I. Model'.

PURPOSE: This book is intended for process engineers working in the field of cold stamping. It can also be used by students at schools of higher technical education and tekhnikums.

COVERAGE: The author discusses the easy manufacturability of parts to be processed by cold stamping, and considers the design, manufacture, setting, and use of dies in the automobile industry. Two appendices are included; the first shows the mechanical properties of stamped materials; the second deals with the allowable width and thickness deviations of sheet, strip, and band. No personalities are mentioned. There are 12 references, all Soviet.

Card 1/4

KUKHTAROV, V.I.; KAZAKOV, Yu.P., inzh., retsenzent; SEREP'YEV, V.V., inzh., retsenzent; BABENKO, V.A., inzh., red.; MARKIZ, Yu.L., red.izd-va; EL'KIND, V.D., tekhn. red.

[Cold stamping]Kholodnaia shtampovka. Moskva, Mashgiz, 1962. 403 p. (MIRA 16:2)

(Sheet-metal work)

KUKHTAROV, V.I.

Saving metals. Avt.prom. 28 no.5:34-35 My '62. (MIRA 15:5)

1. Moskovskiy avtozavod imeni Likhacheva.
(Machinery--Design)

KUKHTENKO, A.I., kandidat tekhnicheskikh nauk.

Maximum permissible speeds for underground mining machinery. Zap.Inst. gor.mekh. AN URSR no.6:115-128 '48. (MIRA 8:4)
(Mining machinery)

KUKHTENKO, A. I.

22459. KUKHTENKO, A. I. Konferentsii, posvya schehennye pamyati osnovatelya inestituta gorhoi mekhaniki an USSR m.m. fedopova. (Kz-letiyu so dnya smerti). Zapiski in-ta gorhoy mekhaniki (akad. nauk ukr. ssr), No. 7, 1949 S. 78.87.

SO: LEPOTIS' No. 30, 1949

KUKHTENKO, A. I.

KUKHTENKO, A. I. Mechanization of the coal-industry. Kiev, Izd-vo Akademii nauk Ukr,
SSR, 1950. 54 p. (52-15971)

TN813.K83

KUKHTENKO, A.I.

"Statistical Methods in the Study of Control of Mine Machines," Report submitted at Second All-Union Conference on Automatic Control Theory, Moscow, 1953

Sum in 1467

KUKHTENKO A. I.

Kukhtenko A. I., "Automatic Regulation of Coal Cutters with Smooth Delivery," Voprosy avtomatizatsii v ugol'noy promyshlennosti, a collection of articles, Moscow and Leningrad, Ugletekhizdat, 1953, Pages 129-178; 17 figures; bibliography, 3 items.

KUKHTENKO, A. I.

Coal-Mining Machinery

Automatic load regulator for cutting machines and coal combines. Ugol' 28, No. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

KUKHTENKO, Aleksandr Ivanovich; KRYZHANOVSKIY, Oleg Mikhaylovich; SHOYKHET, Lev Abramovich; KUCHEROV, P.S., otvetstvennyy redaktor; TITKOV, B.S., redaktor; RAKHLINA, N.P., tekhnicheskiy redaktor

[Automatic regulation of the "Donbass" cutter-loader] Opyt avtomatizatsii ugol'nogo kombaina "Donbass." Kiev, Izd-vo Akademii nauk Ukrainskoi SSR, 1954. 59 p. (MLRA 8:3)

1. Chlen korrespondent Akademii nauk USSR (for Kucherov)
(Donets basin--Coal mining machinery)

KUKHTENKO, Aleksandr Ivanovich.

Inst of Mining imeni Fedorov Acad Sci UkSSR, Academic degree of Doctor of Technical Sciences, based on his defense, 21 May 1954, in the Soviet of the Inst of Mining Acad Sci USSR, of his dissertation entitled: "Some basic problems of kinematics and dynamics of automatically regulated cutting machines with a smooth delivery".

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no 8, 2 April 55, Byulleten' MVO SSSR, No. 14, July Moscow pp 4-22, Uncl. JPRS/NY-429

KUKHTENKO, A. ~~O~~.I.

One type of dynamic system with anholonomous linkages. Dop. AN URSR no.2:148-151 '54. (MLRA 8:4)

1. Institut girnichoi spravi AN URSR. Predstavleno deystvitel'nym chlenom Akademii nauk USSR G.N.Savinym.
(Mechanics, Analytic)

KUKHTENKO, A.I.

[illegible]

Steadiness of movement in automatically regulated cutting machines with smooth feed. Dop. URSR no.4:300-304 '54. (MIRA 8:4)

1. Institut girnichnoi spravi AN URSR. Predstavleno deystvitel'nym chlenom Akademii nauk USSR G.N.Savinym.
(Coal-mining machinery)

(Institute of Mining AS UkSSR. Presented by Active Member of the Academy of Sciences USSR G. N. Savin)

KUKHTENKO, A.I.

IVAKHNENKO, A.G.; KUKHTENKO, A.I.; KHRAMOY, A.V.; CHINAYEV, P.I.

Creative cooperation of Russian and Ukrainian scientists in the
theory and design of automatic control systems. Avtom. i telem.
15 no.4:289-297 Jl-Ag '54. (MLRA 7:11)
(Automatic control) (Servomechanisms) (Remote control)

KUKHTENKO, A. I.

Math

Kuhtenko, A. I. On a class of mechanisms with nonholonomic constraints. Trudy Inst. Mašinoved. 15 (1955), no. 58, 46–[illegible]. (Russian)

In connection with some regulating mechanisms and mechanical integrators, Appell's equations are written down for systems with two degrees of freedom constrained by one equation linear and homogeneous in the velocities. Most of the material is expository. The main purpose of the paper is, presumably, to bring the theory of nonholonomic constraints within reach of the engineer not trained in analytical dynamics.

A. W. Wundheiler (Chicago, Ill.).

KUKHTENKO, O. I.

1-FW

Kuhtenko, O. On the theory of small oscillations and the stability of motion of systems with non-holonomic constraints. Akad. Nauk Ukrain. RSR. Prikl. Meh. 1 (1955), 205–223. (Ukrainian. Russian summary)

Math

In the vibration problem of a non-holonomic dynamical system there is a difference of opinion. E. T. Whittaker has shown [Analytical dynamics, 4th ed., Cambridge, 1937] that the vibration problem of such a system with s independent coordinates and l nonintegrable kinematical constraints reduces to the problem of a holonomic system with $s-l$ degrees of freedom since the kinematical relations of the form $\sum A_{kr}\dot{q}_r=0$ can be integrated because $A_{kr}=\text{const}$. On the other hand, O. Bottema has shown [Nederl. Akad. Wetensch., Proc. 52 (1944), 848–850; MR 11, 470] that in such a case it is necessary to apply the Lagrange equations with undetermined multipliers. In this paper the author shows that Bottema's relations have restricted applicability, i.e. only in the case when the system vibrates about the configuration of stable equilibrium, and that in the first approximation in the case when system vibrates about the stationary state of equilibrium and that of the first approximation in the case when system vibrates about the stationary state of motion the relevant zeros do not exist. One example is treated.

D. Rašković (Belgrade).

A.
KUKHTENKO, O.I.

Automatization of coal combines. Visnyk AN URSR 26 no.2:58-59
F '55. (MLRA 8:4)
(Coal-mining machinery)

Kukhtenko, A.I.

FEDOROV, Mikhail Mikhaylovich; IL'ICHEV, A.S. redaktor [deceased];
KOSMITSEVICH, Z.I., kandidat tekhnicheskikh nauk, redaktor;
KUCHEROV, P.S., redaktor; FEDOROVA, Z.M., kandidat tekhnicheskikh
nauk, redaktor; [redacted], doktor tekhnicheskikh nauk,
redaktor; KRYZHANOVSKIY, O.M., kandidat tekhnicheskikh nauk, redaktor
SAVIN, G.N., akademik, otvetstvennyy redaktor; ZIL'BAN, M.S.,
redaktor izdatel'stva; RAKHLINA, N.P., tekhnicheskiy redaktor

[Selected works in two volumes] Izbrannye trudy; v dvukh tomakh.
Kiev, Izd-vo Akad. nauk USSR. Vol.1. 1957. 274 p. (MIRA 10:6)

1. Akademiya nauk USSR (for Savin). 2. Clen-korrespondent
Akademii nauk SSSR (for Il'ichev). 3. Chlen-korrespondent Akademii
nauk USSR (for Kucherov)
(Mine hoisting)

КУКНТЕНКО, О. І. [А.І.]

KUKHTENKO, O.I.

[redacted]

Automatization in the coal industry of the Ukrainian S.S.R. Avtomatyka no.4:5-12 '57. (MIRA 11:1)

1. Institut girnichoi spravi AN URSR.
(Ukraine--Coal mines and mining) (Automatic control)

KUCHEROV, P.S., otv.red.; STARIKOV, N.A., akademik, red.; PEN'KOV, A.M., red.; KUKHTENKO, A.I., doktor tekhn.nauk, red.; KOVSHULYA, A.A., kand.tekhn.nauk, red.; GARMASH, N.Z., kand.tekhn.nauk, red.; KISINA, I.V., red.izd-va; YURCHISHIN, V.I., tekhn.red.

[Tapping and working mineral deposits] Voprosy vskrytiia i razrabotki mestorozhdenii poleznykh iskopaemykh. Kiev, 1958. 172 p. (MIRA 12:6)

1. Akademiya nauk USSR, Kiyev. Institut gornogo dela. 2. Chlen-korrespondent AN USSR (for Kucherov, Pen'kov). 3. AN USSR (for Starikov).

(Mining engineering)

KUKHTENKO, A. I.

A. I. Kukhtenko, "Theoretical Probability Methods for the Description of the Work Processes of Machines."

paper presented at the 2nd All-Union Conf. on Fundamental Problems in the Theory of Machines and Mechanisms, Moscow, USSR, 24-28 March 1958.

KUKHTENKO, A.I.

PHASE I BOOK EXPLOITATION SOV/4526

Soveshchaniye po teorii invariantnosti i yeye primeneniyu v avtomaticheskikh ustroystvakh. Kiyev, 1958

Teoriya invariantnosti i yeye primeneniye v avtomaticheskikh ustroystvakh; trudy soveshchaniya (Theory of Invariance and Its Applications to Automatic Devices; Transactions of the Conference Oct. 16-20, 1958) Moscow, 1959. 381 p. No. of copies printed not given.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Otdeleniye tekhnicheskikh nauk.

Resp. Ed.: V.S. Kulebakin, Academician; Editorial Commission: V.A. Bodner, Doctor of Technical Sciences, A.G. Ivakhnenko, Doctor of Technical Sciences, A.Yu. Ishlinskiy, Academician, Academy of Sciences UkrSSR, N.A. Kachanova, Candidate of Technical Sciences, P.I. Kuznetsov, Doctor of Physics and Mathematics, A.I. Kukhtenko, Doctor of Technical Sciences, B.N. Petrov, Corresponding Member, Academy of Sciences USSR, Ye.P. Popov, Doctor of Technical Sciences, G.M. Ulanov, Doctor of Technical Sciences, K.K. Khrenov, Academician, Academy of Sciences UkrSSR, P.I. Chinayev, Candidate of Technical Sciences, and N.M. Chumakov, Candidate of Technical Sciences; Tech. Ed.: I.V. Kruglov.

PURPOSE: This collection of papers is intended for engineers and other specialists working in various fields of automation.

~~Card 1/8~~

Theory of Invariance (Cont.) SOV/4526

COVERAGE: The collection includes reports and papers presented at the Conference on the Theory of Invariance and Its Applications to Automatic Devices, which was called by the Otdeleniye tekhnicheskikh nauk (Department of Technical Sciences) and the Institut elektrotekhniki (Institute of Electrical Engineering) of the Academy of Sciences of the Ukraine and convened in Kiyev October 16 - 20, 1958. The papers presented are concerned with high-quality automatic control systems designed on the basis of compensating for the effects of disturbances or maintaining the invariance of the quality to be regulated with respect to the disturbances acting on the system. The reports treat the physical and mathematical foundations of invariance in automatic control systems; they also consider methods for designing and calculating invariant systems and problems connected with specific cases of practical applications of compensation in various automatic systems. On the basis of these reports it was established by the Conference that, by utilization of the conditions of compensation and the principle of invariance, it is possible to produce automatic systems and various arrangements which are more perfect from the viewpoint of quality of the regulation and control process, stability, simplicity of construction, and reliability of operation. The following members of the Kiyev Seminar on Automatic Control are mentioned as organizers of the conference: A.I. Kukhtenko, A.G. Ivankhenko, Yu.G. Kornilov, O.M. Kryzhanovskiy, N.M. Chumakov, N.A. Kechanova, and P.I. Chinayev. References accompany each article.

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3. Petrov, B.N. On the Feasibility of Conditions for Invariance 59

4. Ishlinskiy, A.Yu. Complete Compensation of External Disturbances Caused by the Maneuvering in Gyroscopic Systems 81

5. Ulanov, G.M. Invariance up to ε in Combined Automatic-Control Systems 93

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KUKHTENKO, A.I.

PHASE I BOOK EXPLOITATION SOV/4530

Vsesoyuznoye soveshchaniye po osnovnym problemam teorii mashin i mekhanizmov. 2d, Moscow, 1958.

Dinamika mashin; sbornik statey (Dynamics of Machines; Collection of Articles) Moscow, Mashgiz, 1960. 240 p. (Its: Trudy) Errata slip inserted. 3,000 copies printed.

Sponsoring Agency: Institut mashinovedeniya Akademii nauk SSSR.

Editorial Board: I. I. Artobolevskiy (Resp. Ed.) Academician, S. I. Artobolevskiy, Doctor of Technical Sciences, Professor, O. G. Baranov, Doctor of Technical Sciences, Professor, A. P. Bessonov, Candidate of Technical Sciences, V. A. Gavrilenko, Doctor of Technical Sciences, Professor, A. Ye. Kobrinskiy, Doctor of Technical Sciences, N. I. Levitskiy, Doctor of Technical Sciences, Professor, and L. N. Reshetov, Doctor of Technical Sciences, Professor;

Ed.: L. V. Bezmenova, Candidate of Technical Sciences; Managing Ed. for General Technical Literature and Literature on Transport Machine Building (Mashgiz): A. P. Kozlov, Engineer; Tech. Ed.: B. I. Model'.

PURPOSE: This collection of articles is intended for engineers, designers, workers at scientific research institutes, and instructors at schools of higher technical education.

COVERAGE: This collection consists of reports presented at the All-Union Conference on Problems in the Theory of Machines and Mechanisms held in Moscow in 1958. The reports discuss several problems of the dynamic design of complex mechanical systems. No personalities are mentioned. References accompany most of the articles.

Kozhevnikov, S. N., Corresponding Member of the Academy of Sciences Ukrainskaya SSR, and Ya. M. Raskin, Candidate of Technical Sciences. Investigation of a Vibratory-Impact Mechanism 101

Kononenko, V. O., Doctor of Technical Sciences, Professor. Some Problems in the Dynamics of Machines With a Vibrating Load 117

Kukhtenko, A. I., Doctor of Technical Sciences, Professor. Theoretical-Statistical Method of Describing the Process of Operation of Machines 128

Malyshev, A. P., Doctor of Technical Sciences, Professor. Stress Analysis of Mechanisms Which Contain Statically Indeterminate Units 140

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Paley, M. B., Engineer. Dynamics of the Main Drive of a Milling Machine 166

Petrokas, L. V., Doctor of Technical Sciences, Professor. Calculation of Some Types of Cam and Push-Rod Mechanisms With Hydraulic and Elastic Connections 186

Pust, L., Candidate of Technical Sciences (Prague). Effect of the Nonlinear Characteristics of Springs on the Vibration of Machine Foundations 203

Rayevskiy, N. P., Candidate of Technical Sciences. Advances and Present State of the Experimental Dynamics of Machines 215

Teskhovich, L. I., Candidate of Technical Sciences. Irregular Processes in a Torsionally Oscillating Electromechanical System and its Simulation 222

Shoykhet, L. A., Candidate of Technical Scienes. Motions of a Pendulum Under the Effect of Random-Type Vibrations 235

AVAILABLE: Library of Congress (TJ181.V8 1958)

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KuKHTENKO, A. I.

report to be presented at the 1st Intl Congress of the Intl Federation of Automatic Control, 25 Jun-5 Jul 1960, Moscow, USSR.

BYKHOVSKIY, M. L. - "Ultra stability in electronic calculating devices in the solution of nonlinear equations in indefinite form"
CHELYUSTKIN, A. B. - "Use of calculating devices in systems for the automatic control of rolling mills"
CHICHINADZE, V. K. - "Concerning some problems of the organization of self-adjusting and self-teaching systems of automatic control, based on principles of random search"
DAVYDOV, N. I. - "Development of automatic control systems for boiler units"
DUDNIKOV, Ye. G. - "Determination of optimum adjustments of industrial automatic regulation systems according to initial data obtained from experience"
DUR'YE, A. I., and ROZENVASSER, E. N. - "Methods of organizing Lyapunov functions in the theory of nonlinear regulating systems"
DRUZHININ, N. N. - "Balanced regulation and inter-communications of a multi-motor electric drive and technology in continuous rolling mills"
FEL'DBAUM, A. A. - "Problems of statistical theory of automatic optimization systems"
FEYGIN, Y. I. - "Automation of a reversible cold rolling mill for nonferrous metals"
FILIPPOV, A. F. - "Application of the theory of differential equations with a discontinuous right side to nonlinear problems of automatic regulation"
GAVRILOV, M.A. - "Structural surplus and operational reliability of relay devices"
GANKIN, M. Z. - "Automation of irrigation systems"
GERTSENBERG, G. R., KASHTELYAN, V. E., KOSTENKO, M. P., NEYMAN, L. R., and SIRIY, N. S. - "Power regulation of disturbance and problems of the stability of electric power systems"
GINZBURG, S. A. - "Logical method of synthesis of functional converters"
IL'IN, V. A. - "Methods of transmission of information and the structure of telemechanical systems for dispersed structures"
INOSOV, V. L., and LITSKIY (fnu) - "The code-impulse system of telemeasurement for dispatched operations of trunk-line gas pipe lines"
IVAKHNENKO, A.G. - "Concerning the application of the theory of combined regulation systems for cybernetic adaptation systems"
KARANDEYEV, K. B., and SHTAMBERGER, G. A. - "A quasi-equilibrated bridge as an element in a system of automatic control"
KAZAKEVICH, V. V. - "Concerning the process of extra regulation of inert objects in the presence of disturbance"
KAZAKOV, I, E. - "Some problems of the theory of statistical linearization and its application"
KILIN, F. M. - "Some problems of the theory of impulse systems with time selectors"
KOBRINSKIY, A. E., BOLKHOVITIN, S. V., VOSKOBOYNIKOV, L.M., IOFFE, D. M., POLYAN, E. P., POPOV, B. P., SLAVUTSKIY, Ya. L., SYSIN, A. Ya., and YAKOBSON. Ya. S. - "The problem of bioelectric control"
KOLOMIYETS, B.T., - "New types of photo resistances and their field of use"
KOPCHENKO, M.I., MIKHEYEV, B. G., and SHUMILOV, K. A. - "System of automatic control and regulation of blast distribution in the tuyeres of blast furnace"
KOROBOCHKIN, B. L. - "Investigation of the dynamics of the hydraulic duct of a copying lathe"
KRASOVSKIY, A. A. - "Dynamics of continuous systems of automatic regulation with extra self-adjustment of corrective devices"
KRASOVSKIY, N. N. - "Concerning the selection of parameters of optimum stability systems"
KUKHTENKO, A. I. - "The dynamics of devices imitating living organisms"
KULEBAKIN, V. S. - "The invariant theory of automatic regulation and control systems"
LANIN, I. D. - "Pneumatic calculating devices as a means of insuring the reliability of complex automation systems"
LAZAREV, V. G., and PARKHOMENKO, P.P. - "Mechanization of processes of analysis and synthesis of the structure of relay devices"

FEDOROV, Mikhail Mikhaylovich; KHOMITSEVICH, K.I., kand.tekhn.nauk, red.toma; KUCHEROV, P.S., red.; KUKHTENKO, A.I., doktor tekhn. nauk, red.; FEDOROVA, Z.M., kand.tekhn.nauk, red.; KRYZHANOVSKIY, O.M., kand.tekhn.nauk, red.; ZIL'BAN, M.S., red.izd-va; MATVEYCHUK, A.A., tekhn.red.

[Selected works in two volumes] Izbrannye trudy v dvukh tomakh. Kiev, Izd-vo Akad.nauk USSR. Vol.2. 1960. 462 p. (MIRA 13:7)

1. Deystvitel'nyy chlen AN USSR (for Fedorov). 2. Chlen-korrespondent AN USSR (for Kucherov).
(Mining machinery)

KUKHTENKO, O.I.; SHOYKHET, L.A.; KOZAR, V.O.

Automatic regulator of the "Donbas-2" cutter-loader and results of its industrial and mine testing. Sbir. prats' Inst. hir. spravy AN URSR no.6:25-38 '60. (MIRA 13:9)
(Coal mining machinery) (Automatic control)

KUKHTENKO, A. I.

"Concerning Self-Learning Control Systems,"

Report submitted for the Symposium on Principles in the Design of Self-Learning Systems, Kiev Ukr SSR, 5-9 May 1961

KUKHTENKO, Aleksandr Ivanovich; SVETLICHNYY, Pavel Luk'yanovich; SHOYKHET, Lev Abramovich; SHURIS, Naum Aronovich; MIRSKAYA, V.V., red. izd-va; BOLDYREVA, Z.A., tekhn. red.

[Automation of mining operations] Avtomatizatsiia ochistnykh i prokhodcheskikh rabot. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1961. 274 p. (MIRA 14:6)
(Automation) (Coal mining machinery)

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E061/E135

26.2195

AUTHOR: Kukhtenko, A. I. (Kiyev)

TITLE: Criteria of absolute invariance for regulating systems with variable parameters

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1961, No.2, pp. 106-113

TEXT: The paper considers the conditions of absolute invariance, that is the conditions under which the controlled variable or variables are independent of the disturbance inputs, for a system with variable parameters. Systems with constant parameters are considered first. Let x, y, z be controlled variables; λ, μ, γ variables of the measuring elements; σ_1, σ_2, σ_3 servomotor variables; and F_1, F_2, F_3 disturbances. Then a system with two controlled variables is described by the following differential equations: the equations of the controlled system

$$\begin{aligned} a_{11}x + a_{12}y + a_{15}\sigma_1 + a_{16}\sigma_2 &= F_1(t) \\ a_{12}x + a_{22}y + a_{25}\sigma_1 + a_{26}\sigma_2 &= F_2(t) \end{aligned} \qquad (1.1)$$

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Criteria of absolute invariance ....

the equations of the measuring and simplifying elements

$$a_{31}x + a_{33}\lambda + a_{35}\sigma_1 = 0$$

$$a_{42}y + a_{44}\mu + a_{46}\sigma_2 = 0 \qquad (1.2)$$

the servomotor equations

$$a_{55}\lambda + a_{55}\sigma_1 = 0$$

$$a_{64}\mu + a_{66}\sigma_2 = 0 \qquad (1.3)$$

The conditions of invariance for such a system are:

$$\begin{vmatrix} a_{44}(p) & a_{46}(p) \\ a_{64}(p) & a_{66}(p) \end{vmatrix} \equiv 0, \qquad \begin{vmatrix} a_{33}(p) & a_{35}(p) \\ a_{53}(p) & a_{55}(p) \end{vmatrix} \equiv 0 \qquad (1.5)$$

For a system with three controlled variables we have:

$$a_{11}x + a_{12}y + a_{13}z + a_{17}\sigma_1 + a_{18}\sigma_2 + a_{19}\sigma_3 = F_1(t)$$

$$a_{21}x + a_{22}y + a_{23}z + a_{27}\sigma_1 + a_{28}\sigma_2 + a_{29}\sigma_3 = F_2(t) \qquad (1.6)$$

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Criteria of absolute invariance S/024/61/000/002/007/014
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$$a_{31}x + a_{32}y + a_{33}z + a_{37}\sigma_1 + a_{38}\sigma_2 + a_{39}\sigma_3 = F_3(t) \qquad (1.6)$$

(the equations of the controlled system);

$$\begin{aligned} a_{41}x + a_{44}\lambda + a_{47}\sigma_1 &= 0 \\ a_{52}y + a_{55}\mu + a_{58}\sigma_2 &= 0 \\ a_{63}z + a_{66}\gamma + a_{69}\sigma_3 &= 0 \end{aligned} \qquad (1.7)$$

(the equations of the measuring and amplifying elements);

$$\begin{aligned} a_{74}\lambda + a_{77}\sigma_1 &= 0 \\ a_{85}\mu + a_{88}\sigma_2 &= 0 \\ a_{96}\gamma + a_{99}\sigma_3 &= 0 \end{aligned} \qquad (1.8)$$

(the servomotor equations); and

$$\begin{vmatrix} a_{44}(p) & a_{47}(p) \\ a_{74}(p) & a_{77}(p) \end{vmatrix} = 0, \quad \begin{vmatrix} a_{55}(p) & a_{58}(p) \\ a_{85}(p) & a_{88}(p) \end{vmatrix} = 0, \quad \begin{vmatrix} a_{66}(p) & a_{69}(p) \\ a_{96}(p) & a_{99}(p) \end{vmatrix} = 0 \qquad (1.9)$$

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Criteria of absolute invariance S/024/61/000/002/007/014
E061/E135

which are the conditions of invariance.
Next, consideration is given to the conditions of invariance in a regulator system in which the controlled object has variable parameters. The system is represented by the following differential equations:
the equations of the controlled object

$$a_{11}(p, t)x + a_{13}(p, t)\sigma = f(t); \qquad (2.1)$$

the equations of the measuring and amplifying elements

$$a_{21}(p)x + a_{22}(p)\lambda + a_{23}(p)\sigma = 0; \qquad (2.2)$$

and the servomotor equations

$$a_{32}(p)\lambda + a_{33}(p)\sigma = 0, \qquad (2.3)$$

where all a operators are of the second order and a_{11}, a_{12} have coefficients which are functions of time. The condition of absolute invariance of the system is shown to be

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Criteria of absolute invariance..... S/024/61/000/002/007/014
E061/E135

$$\left[\Delta_{11} a_{11}(p, t) + a_{21}(p)\, a_{32}(p)\, a_{13}(p, t)\right] x = \Delta_{11} f(t)$$

$$\Delta_{11} = \begin{vmatrix} a_{22}(p) & a_{23}(p) \\ a_{32}(p) & a_{33}(p) \end{vmatrix} \neq 0 \qquad (2.4)$$

which is the general condition of invariance for a system with constant parameters. The criterion of absolute invariance is thus general for objects both with constant and with variable parameters. There is no need, as the parameters of the controlled object alter, to alter the parameters of the controller in order to achieve invariance. The result obtained above was confirmed by simulating the system on an analogue computer. It can be shown that in the case of two or three controlled variables the conditions of absolute invariance for constant parameters also hold for an object with variable parameters. Consideration is then given to the conditions of invariance of a control system in which both the controlled object and the control system have variable parameters. The equations describing such a system are (3.1):

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$$a_{11}(p, t)x + a_{13}(p, t)\sigma = f(t)$$
$$a_{21}(p, t)x + a_{22}(p, t)\lambda + a_{23}(p, t)\sigma = 0 \qquad (3.1)$$
$$a_{32}(p, t)\lambda + a_{33}(p, t)\sigma = 0$$

where $a_{ij}(p, t)$ are differential operators of an order not higher than two, with variable coefficients of the form

$$a_{ij}(p, t) = m_{ij}(t)p^2 + \ell_{ij}(t)p + k_{ij}(t) \quad (i, j = 1,2,3) \qquad (3.2)$$

where $m_{ij}(t)$, $\ell_{ij}(t)$, $k_{ij}(t)$ are functions of t.

The conditions of invariance of such a system are formed for three cases: (1) the operators a_{22}, a_{23}, a_{32}, a_{33} are of the second order and the conditions of invariance are

$$k_{22}k_{33} - k_{23}k_{32} = 0, \quad k_{22}\ell_{33} + \ell_{22}k_{33} - k_{32}\ell_{23} - \ell_{32}k_{23} = 0$$
$$k_{22}m_{33} + k_{33}m_{22} + \ell_{22}\ell_{33} - k_{32}m_{23} - m_{32}k_{23} - \ell_{32}\ell_{23} = 0 \qquad (3.14)$$
$$\ell_{22}m_{33} + m_{22}\ell_{33} - \ell_{32}m_{23} - m_{32}\ell_{32} = 0, \quad m_{22}m_{33} - m_{32}m_{33} = 0$$

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which are formally the same as the conditions of invariance for a system with constant coefficients, but the terms entering Eq.(3.14) are functions of time.

(2) The operators a_{32} and a_{33} are of the first order and a_{22} and a_{23} of the second. The conditions of invariance are

$$\begin{gathered} m_{22}l_{33}-m_{23}l_{32}=0 \\ \frac{m_{22}}{l_{32}}\left(k_{32}'-\frac{k_{32}}{k_{33}}k_{33}'\right)+\frac{k_{32}k_{21}}{k_{33}}-k_{22}=0 \\ \frac{m_{22}}{l_{33}}\left(l_{33}'-\frac{l_{33}}{k_{33}}k_{33}'\right)+\frac{m_{23}}{l_{32}}k_{33}+\frac{k_{33}l_{21}}{k_{33}}-l_{21}=0 \\ \frac{m_{23}}{l_{32}}\left(l_{32}'-\frac{l_{32}}{k_{33}}k_{33}'\right)+\frac{m_{22}}{l_{32}}k_{33}+\frac{k_{32}l_{12}}{k_{33}}-l_{22}=0 \end{gathered} \qquad (3.15)$$

(3) The operators a_{32} and a_{33} are of the zeroth order and a_{22}, a_{23} are of the second order. The conditions of invariance are

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Criteria of absolute invariance..... S/024/61/000/002/007/014
E061/E135

$$m_{22}k_{33} - m_{23}k_{32} = 0$$

$$2\frac{m_{23}}{k_{33}}\left(k_{32}' - \frac{k_{32}k_{33}'}{k_{33}}\right) + l_{23}\frac{k_{32}}{k_{33}} - l_{22} = 0 \qquad (3.16)$$

$$\frac{m_{23}}{k_{33}}\left[k_{32}'' - \frac{k_{32}}{k_{33}}k_{33}'' + 2\frac{\left(\frac{k_{32}}{k_{33}}k_{33}' - k_{32}'\right)k_{33}'}{k_{33}^2}\right] + \frac{l_{23}k_{32}'}{k_{33}} - \frac{l_{23}k_{32}k_{33}'}{k_{33}^2} + \frac{k_{23}k_{32}}{k_{33}} - k_{22} = 0$$

All other possible combinations yield analogous results.
With variable coefficients the conditions of invariance are much more difficult to realize than with constant coefficients, since the system must adjust itself to maintain invariance.
There are 1 figure and 11 Soviet references.

SUBMITTED: July 26, 1960

Card 8/8

S/021/61/000/004/005/013
D213/D303

16,3400 16,800 A.1

AUTHOR: Kukhtenko, ~~O.I.~~

TITLE: Extension of the criterion of absolute invariance to objects with variable parameters

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 4, 1961, 434 - 437

TEXT: The author considers a system of differential equations of the form

$$\left.\begin{aligned} &a_{11}(p,t)x_1 + a_{13}(p,t)x_3 = F(t)\\ &a_{21}(p)x_1 + a_{22}(p)x_2 + a_{33}(p) = 0\\ &a_{32}(p)x_2 + a_{33}(p)x_3 = 0 \end{aligned}\right\} \quad (1)$$

The operatirs of the first equation (the object) have coefficients which are functions of time

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Extension of the criterion ...

S/021/61/000/004/005/013
D213/D303

$$a_{11}(p,t) = m_{11}(t)p^2 + l_{11}(t)p + k_{11}(t),$$
$$a_{13}(p,t) = m_{13}(t)p^2 + l_{13}(t)p + k_{13}(t).$$

and the operators of the second and third equations (the control systems) have constant coefficients. ($p = d/dt$). The dependence of x_1 on the external force F(t) is investigated. In the case of constant coefficients the expression for the invariance is

$$\begin{vmatrix} a_{22}(p) & a_{23}(p) \\ a_{32}(p) & a_{33}(p) \end{vmatrix} \equiv 0. \quad (2)$$

The formula for multiplying operators in the case of variable coefficients is also given. In Eq. (1) x_2 characterizes the position of the measuring element of the regulator and x_3 characterizes the servo-motor. The operator u_1 [Abstractor's note: The operator is

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24133

Extension of the criterion ...

S/021/61/000/004/005/013
D213/D303

not defined], is applied to the left-hand-side of the second equation of (1) and values from the third equation are substituted in the result. x_2 is eliminated to give

$$u_1(p, t) * a_{22} = a_{32}. \tag{5}$$

From $(u_1 * a_{21})x_1 + [(u_1 * a_{22}) - a_{32}]x_2 + [(u_1 + a_{23}) - a_{33}]x_3 = 0$ (4)

and (5)

$$A_1(p,t)\,x_1 + A_2(p,t)\,x_3 = 0,$$

where

$$A_1(p,t) = u_1 * a_{31},$$
$$A_2(p,t) = (u_1 * a_{23}) - a_{33}. \tag{6}$$

[Abstractor's note: The a symbols are not defined]. The author concludes that the invariance criteria have the same form as for controlled objects with constant parameters. The author states that

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S/021/61/000/004/005/013
Extension of the criterion D213/D303

the method may be extended to cases, where the polynomials in Eq. (1) are of a degree higher than two, and also to cases where there are several regulated parameters simultaneously. There are 5 Soviet-bloc references.

ASSOCIATION: Kyyivs'kyy instytut tsyvil'noho povitryanoho flotu (Kyyiv Institute of Civil Aviation)

SUBMITTED: July 23, 1960

Card 4/4

S/021/61/000/005/005/012
D215/D304

AUTHORS: Kukhtenko, A.I., and Shuman, B.M.

TITLE: Invariance conditions for linear systems with variable parameters

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 5, 1961, 606 - 611

TEXT: The present article is based on the earlier research of O.I. Kukhtenko (Ref. 1: DAN URSR, 434, 1961) and is a continuation of it. In this paper the author considers the case where the controlled members and the control systems are both described by equations with variable coefficients. They are as follows:

$$a_{11}(p, t)x_1 + a_{13}(p, t)x_3 = F(t), \; a_{21}(p, t)x_1 + a_{22}(p, t)x_2 + a_{23}(p, t)x_3 = 0, \; a_{32}(p, t)x_2 + a_{33}(p, t)x_3 = 0 \qquad (1)$$

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S/021/61/000/005/005/012
D215/D304

Invariance conditions for ...

where $a_{ij}(p, t)$ are differential operators of not higher than the second order, i.e.

$$a_{ij}(p, t) = m_{ij}(t)p^2 + l_{ij}(t)p + k_{ij}(t); \qquad (2)$$

Any notation and formulae which the author uses are explained in (Ref. 1: Op.cit.). Eqs. (5) and (12) from (Ref. 1:Op.cit.) are valid for variable coefficients and they are presented again

$$u_1(p, t) * a_{22}(p, t) = a_{32}(p, t), \qquad (3)$$

$$u_1(p, t) * a_{23}(p, t) = a_{33}(p, t). \qquad (4)$$

Each of the functions a_{22}, a_{23}, a_{32}, a_{33} could be a polynomial of the second order at most. Solutions of these equations are obtained by the comparison of the coefficients of p of the same order, on both sides of Eqs. (3) and (4). The author considers three subcases, which are most important in practical applications. Operators a_{22}, a_{23}, a_{32}, a_{33} are of the same order - either first or second.

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S/021/61/000/005/005/012
D215/D304

Invariance conditions for ...

Operators a_{22}, a_{23} are of the first order when a_{32}, a_{33} are of the second order. Using the same method of comparison of coefficients he obtains new conditions of invariance. Operators a_{23}, a_{22} are of zero order and operators a_{33}, a_{32} of the second order. Conditions of invariance obtained in (Ref. 1: Op.cit.) are the special case of these obtained in present paper, when one substitutes $k'_{23} = k'_{22} = k'_{33} = k'_{22} = 0$ and $m_{23} = m_{22} = 0$. All other combinations for coefficients a_{22}, ... a_{33} would be examined analogously. There are 2 Soviet-bloc references.

ASSOCIATION: Kyyivs'kyy instytut tsyvil'noho povitoyanoho flotu (Kiyev Institute of Civil Aviation)

✓

PRESENTED: G.M. Savios, Member of AS UkrSSR

SUBMITTED: July 23, 1960

Card 3/3

ACCESSION NR: AT4016406 S/3049/62/000/000/0073/0087

AUTHOR: [illegible]enko, A. I.

TITLE: Some classes of self-adjusting automatic control systems

SOURCE: Printsipy* postroyeniya samoobuchayushchikhsya sistem (Principles of construction of self-instructing systems). Sbornik materialov simpoziuma, 1961. Kiev, Gostekhizdat UkrSSR, 1962, 73-87

TOPIC TAGS: self-adjusting system, cybernetics, control system, self instruction, automatic control

ABSTRACT: The author discusses the attributes, on the basis of which it is possible to classify self-adjusting systems with respect to: 1) selection of a rational (optimal) operational mode for the system; 2) ensuring the existence of the preselected rational mode. In his attempt to develop this classification scheme, the author distinguishes between: 1) systems with passive adjustment; 2) systems with logical nonlinear elements for adjustment; 3) systems with changing parameters; 4) systems with changing characteristics; 5) systems with changing structure. A special position is occupied by the so-called systems with extremum regulators. It is also essential to classify self-adjusting systems from the mathematical point of view. This gives rise to a discussion of:

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ACCESSION NR: AT4016406

self-adjusting systems based on the search for maxima or minima of functions, self-adjusting systems whose operation is based on the solution of variational problems and, finally, self-adjusting systems based on the invariance criterion. All these types are analyzed in detail and indicate the great variety of principles on which may be based the development of advanced automatic control systems. The author concludes that the role and importance of self-adjusting systems is constantly increasing and, for this reason, the technical devices will gradually approach, in terms of their flexibility and perfection, the systems created by nature herself, and possibly even exceed them. Orig. art. has: 2 figures and 19 formulas.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 06Jan64 ENCL:00

SUB CODE: IE NO REF SOV: 009 OTHER: 005

Card 2/2

AM4033675 **BOOK EXPLOITATION** S/

Kukhtenko, Aleksandr Ivanovich (Doctor of Technical Sciences)

The problem of invariance in automation (Problema invariantnosti v avtomatike)
Kiev, Gostekhizdat USSR, 63. 0375 p. illus., biblio. 4,700 copies printed.

TOPIC TAGS: automatic control, automatic regulation, invariance principle, automatic piloting, automatic gyroscopic system, matrix theory, differential equations, operational calculus, self-adaptive system, nonlinear system, pulsed system

PURPOSE AND COVERAGE: The book presents matrix and operational methods for solution of invariance problems for various classes of automatic control systems, constructed both on the basis of error control and on the basis of combined control. The criteria for the physical realizability of absolutely invariant systems are indicated, and the method of using these criteria for choosing the physically realizable systems is given. Examples of application of the theory of invariance in a construction of automatic piloting, gyroscopic, and other systems are given. The book is intended for scientific workers, engineers, and senior students of the corresponding specialties, who wish a deeper study of the dynamics of automatic control and regulation systems. The author is grateful to Academician V. S.

Card 1/3

AM4033675

Kulebakin and Academician B. N. Petrov for continuous interest, Doctor of Technical Sciences O. M. Kryzhanovskiy for reading the manuscript, Candidate of Physical-Mathematical Sciences A. I. Koronkevich for reading several chapters, and to Candidate of Technical Sciences A. G. Shevelev and Candidate of Technical Science V. V. Pavlov for much help in the preparation of the manuscript.

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SUB CODE: IE, MM SUBMITTED: 04Oct63 NR REF SOV: 144

OTHER: 014 DATE ACQ: 16Apr64

Card 3/3

KULEBAKIN, V.S., akademik, otv. red.; PETROV, B.N., akademik, otv. red.; BODNER, V.A., doktor tekhn. nauk, red.; VORONOV, A.A., doktor tekhn. nauk, red.; IVAKHNENKO, A.G., red.; ISHLINSKIY, A.Yu., akademik, red.; KOSTYUK, O.M., kand. tekhn. nauk, red.; KRASSOV, I.M., kand. tekhn. nauk, red.; KUNTSEVICH, V.M., kand. tekhn. nauk, red.; KUKHTENKO,A.I., red.; RYABOV, B.A., doktor tekhn. nauk, red.; SIMONOV, N.I., doktor fiz.-mat. nauk, red.; ULANOV, G.M., doktor tekhn. nauk, red.; FEDOROV, S.M., kand. tekhn. nauk, red.; TSYPKIN, Ya.Z., doktor tekhn. nauk, red.; CHINAYEV, P.I., kand. tekhn. nauk, red.; KRUTOVA, I.N., kand. tekhn. nauk, red.; RUTKOVSKIY, V.Yu., kand. tekhn. nauk, red.

[Invariancy theory in automatic control systems; transactions] Teoriia invariantnosti v sistemakh avtomaticheskogo upravleniia; trudy. Moskva, Nauka, 1964. 503 p. (MIRA 18:2)

1. Vsesoyuznoye soveshchaniye po teorii invariantnosti i yeye primeneniyu v avtomaticheskikh ustroystvakh. 2d, Kiev, 1962. 2. Chlen-korrespondent AN Ukr.SSR (for Ivakhnenko, Kukhtenko).

KUKHTENKO, A.I., doktor tekhn.nauk; SPYNU, G.A., kand.tekhn.nauk

The Second International Congress on Automatic Control.
Avtom. i prib. no. 1:79-80 Ja-Mr '64. (MIRA 17:5)

KUKHTENKO, A.I.

Subject and the methods of the general dynamics of machines. Teor. mash. i mekh. no.98/99:104-118 '64. (MIRA 17:9)

L 34510-65 EWT(d)/EWP(1) Pg-4/Pk-4/Pl-4/Po-4/Pq-4 IJP(c) BC/GS

ACCESSION N[illegible]0 4110 S/0000/64/000/000/0026/0048 47
B+1

AUTHOR: Petrov, B. N. (Academician); Kukhtenko, A. I. (Corresponding member AN UkrSSR)

TITLE: The structure of absolutely invariant systems and conditions for their physical real[illegible]on

SOURCE: Vsesoyuznoye soveshchaniye po teorii invariantnosti i yeye primeneniyu v avtomaticheskikh [illegible]emakh. 2d, Kiev, 1962. Teoriya invariantnosti v sistemakh avtomaticheskogo upravleniya (Theory of invariance in automatic control systems); trudy soveshchaniya. Moscow, Izd-vo Nauka. 1964, 26-48

TOPIC TAGS: invariance, invariant system, nonlinear system, differential equation, automatic [illegible] system 9 16

ABSTRACT: This somewhat lengthy paper is devoted to a study of absolutely invariant systems. The first part of the paper proves various necessary and sufficient conditions for the physical realization of absolutely invariant systems. The second part of the paper studies the properties of absolutely invariant systems based on the physical realization theorems of the first part. In the remainder of the paper, these general theorems are applied to small classes of systems: a system with one regulated parameter, systems with two channels transmitting an

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L 34510-65

ACCESSION NR: AT5004110 0

arbitrary perturbation, systems built on a combinatorial principle of regulation, systems with indirect measurement of perturbations multi-dimensional systems using a deviation principle of regulation, and non-linear invariant systems. Orig. art. has: [illegible] figures and 64 formulas.

ASSOCIATION: No[illegible]

SUBMITTED: 24Se[illegible] ENCL: 00 SUB CODE: MA, IE

NO REF SOV: 02 OTHER: 001

Card 2/2

L 9733-66 [illegible]/EWP(v)/EWP(k)/EWP(h)/EWP(l) IJP(c) GS

ACC NR: AT5[illegible] SOURCE CODE: UR/0000/65/000/000/0098/0112

44, 44,55

AUTHOR: Kukht[illegible], A. I.; Shevelev, A. G.

60

B+1

ORG: none

TITLE: On th[illegible]ss of automatic control systems invariant with respect to variation of parameters

SOURCE: AN UkrSSR. Slozhnyye sistemy upravleniya (Complex control systems). Kiev, Naukova dumka, 1965, 98-112

16,44,55

TOPIC TAGS: automatic control, sensitivity theory, invariance theory, self adaptive control, automatic control system, parameter, function

ABSTRACT: The problem of designing a dynamic system which would be insensitive to variation of its parameters is analyzed. It is indicated that although self-adapting systems in which the dynamic properties of the system remain unchanged with variation of its parameters are this kind of systems, theoretical studies and design of such systems are highly complex problems. Therefore, the author raises the question of whether it is possible to construct systems which have the characteristics of self-adaptive systems and are free of their shortcomings. The possibility of designing such systems is analyzed by using the methods of sensitivity theory and the methods of invariance theory. On the basis of the derived sensitivity equations and using invariance criteria, it is shown that in certain cases it is possible to design a

L 9733-66

ACC NR: AT5028936

0

dynamic system which is insensitive to variations of its parameters. The possibility of designing such invariant systems is illustrated by two examples: 1) the system is described by a system of four equations whose two coefficients $a_2(t)$ and $k_2(t)$ are considered as arbitrarily varying functions within certain given bounds; 2) an airplane autopilot system. Orig. art. has: 4 figures and 29 formulas. [LK]

SUB CODE: 13, 12 / SUBM DATE: 03Aug65/ ORIG REF: 007/ OTH REF: 001/ ATD PRESS: 4157

Card 2/2

GLUSHKOV, V.M., otv. red.; KUKHTENKO, A.I., zam. otv. red.;
BLAGOVESHCHANSKIY, Yu.V., red.; DORODNITSYN, A.A., red.;
YERSHOV, A.P., red.; LYAPUNOV, A.A., red.; MOSKALEV,
I.S., red.; PUKHOV, G.Ye., red.; ROSTUNOV, T.I., red.;
SAMOKHVALOV, K.G., red.; STOGNIY, A.A., red.; TIMOFEYEV,
B.B., red.; SHCHERBAN', A.N., red.; LETICHEVSKIY, A.A.,
red.; KAPITONOVA, Yu.V., red.; MEL'NIK, T.S., red.

[Problems of theoretical cybernetics] Voprosy teoreticheskoi kibernetiki. Kiev, Naukova dumka, 1965. 209 p.
(MIRA 18:9)

1. Akademiya nauk URSR, Kiev.

KUKHTENKO, I. I.

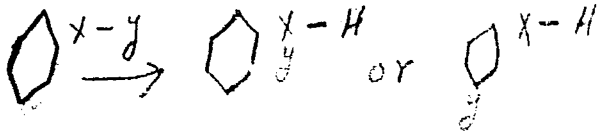
USSR/Chemistry - Phenols
    Chemistry - Hydrogen

Aug 1947

"Hydrogen Regrouping in Phenols," A. I. Brodskiy, Corr Mem, Acad Sci USSR; G. P. Miklukhin, I. I. Kukhtenka, I. P. Gragerov, Inst Phys Chem imeni L. V. Pisarzhevskiy, Acad Sci USSR, 3 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVII, No 5

Indicates that certain reactions in aromatic compounds may be expressed as follows:



and studies the special case where x = 0 and y = H.

PA 58T8

KUKHTENKO, I. I.

"Regrouping of the hydrogen in phenols," A. I. Brodskiy, G. P. Miklukhin, I. I. Kukhtenko, I. P. Gragerov (Acad. Sci. USSR, Moscow), Doklady Akad. Nauk SSSR, 57, 463-6 (1947); Chem Zentr. (Russian Zone Ed.) 1948, II, 828-9; cf. C.A. 43, 5011c.
Chemisches Zentralblatt

A study was made of the mechanism of the reactions of aromatic compds. reppesented by the formulas PhXY, o-YC_6H_4XH, and p-YC_6H_4XH, in which X = O or NH and Y = OH, NO_2, Me, SO_2H, or allyl. For this purpose, the special case in which X = O and Y = H was investigated. Since this would make the 3 formulas identical, the investigations were carried out with heavy phenols. Phenol with a known content of D a and the OH group and in the nucleus was prepd. from ordinary phenol by treatment with heavy water in the cold and in the absence of catalysts. By this treatment, D displaces the H of the OH rapidly but enters the nucleus slowly. When the phenol so prepd. was heated in a closed tube at 200° the reaction PhOD → o- or p-DC H OH was observed. Equil. was established in less than 50 hrs. with the D equally distributed in the OH group, the ortho, and the para position. No exchange occurred in the meta position. In order to det. whether the migration of the D occurs within the same mol. or involves 2 mols., of PhOD and anisole were heated in a closed tube at 200°. Migration of the D occurs within the same mol. or involves 2 mols., into both the phenol and the anisole nuclei occurred. The same result was observed with phenetole. At first migration of the D from PhOD into the Phenol nucleus was more rapid than migration into the anisole nucleus. The conclusions of Ingold, Raisin, and Wilson served to explain the mechanism of this reaction. When anisole was heated with 3,5-dideuterophenol at 200o for 20-100 hrs., no D was transferred to the anisole.

CA

Kinetics of the hydrogen rearrangement in phenol. A. I. Brodskiĭ and I. I. Kukhtenko (L. V. Pisarzhevskiĭ Inst. Phys. Chem., Kiev). *Dopovidi Akad. Nauk Ukrain. R.S.R.* 1950, 279-81(in Ukrainian).—Tagged PhOD (in PhOH with 3.023% D), pure or in tetrahydronaphthalene soln., heated in sealed tubes, undergoes rearrangement to C_6H_4-DOH, with D passing from the hydroxyl with equal probability into the 3 possible positions in the ring. Within each expt., the rate is of the 1st order, satisfying $-\ln(1 - y) = kt$, where y = amt. of D in the ring (in fractions of the equil. amt.). If the reaction consisted in intramol. migration of D, and on the assumption that at equil. D is equally distributed between the hydroxyl and the 3 positions in the ring, one should have $k = 4k_0$, where k_0 = true rate const. of the monomol. reaction PhOD → C_6H_4DOH. If, on the other hand, the reaction consists in an exchange between 2 mols., it is actually bimol., PhOD + PhOH → PhOH + C_6H_4DOH, and, in soln., $k = 4P(1 - x_0)k_0$, where P = concn. of (PhOH + PhOD) in mole/l., x_0 = fraction of D in the phenol prior to rearrangement, and k_0 = true bimol. rate const. An expt. at 210°, in soln., gave the data: P = 5.46, 2.62, 0.95; k = 0.0158, 0.00770, 0.00248 hr.$^{-1}$; k/P = 0.00289, 0.00294, 0.00261; hence, k_0 = 0.00090 l. mole^{-1}/hr.$^{-1}$. In pure PhOH, k_0 is twice as great. In the pure-liquid phase, at 190, 200, 210°, k = 0.0121, 0.0271, 0.0591 hr.$^{-1}$, hence the activation energy E = 31.8 kcal./mole, and the preexponential factor = $10^{9.41}$ l./mole^{-1}/sec.$^{-1}$ This value corresponds to an electrophilic substitution mechanism, with a quaternary intermediate complex.

N. Thon

KUKHTENKO, I. I.

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Chem

Mobility of hydrogen atoms in the toluene nucleus. I. I. Kukhtenko and A. I. Brodskii. *Doklady Akad. Nauk S.S.S.R.* 86, 733-5(1952).—To answer the question whether o-C_6H_4DMe (I) will, on heating, rearrange spontaneously to an isomer with D in a new position, I was synthesized by gradually adding 120 g. o-BrC_6H_4Me to 400 ml. abs. ether and 20 g. Mg; this mixt. was treated with 17 g. D_2O (35%), then with 15% HCl. After distn. of the solvent and drying, the yield of I (b$_{[illegible]}$ 109.8°, n^{20}_{D} 1.4901) was 50 g. Different portions (10-12 g.) of I, dild. with light PhMe, were heated in sealed tubes 50 hrs. at 295°, 124 hrs. at 400°, 50 hrs. at 300°, or left without heating. The products (10 g.) were brominated 10 hrs. with 6% HOBr, and distd. at 180-3° (yield 50%). The brominated products (0.5 g.) were oxidized by boiling 10 hrs. with a soln. of 13 g. $KMnO_4$ in 215 ml. H_2O. After filtration, HCl pptd. first p-$BrC_6H_4CO_2H$ (m. 252°), and then on further evapn., the much more sol. o-$BrC_6H_4CO_2H$ (m. 148°); total yield, 48%. The D content was detd. by combustion over CuO + $PbCrO_4$ and detn. of the d. of the water. If all the D in I had remained in the ortho position, the excess densities of the combustion water from the o- and the p- $BrC_6H_4CO_2H$ should stand in the ratio 1:2; if D had distributed itself equally between the ortho and the para position, that ratio should be 1:1; and if the D had passed into the meta-position or into the Me group, the ratio should lie between 0.5 and 1. The expts. gave conclusively a ratio of 0.5. Consequently, there is no spontaneous rearrangement in I involving a migration of the D atom into a new position.

N. Thon

TRAPEZNIKOVA, T.I.

Mechanism of the reaction of bromination of toluene in the methyl group. L. L. [illegible] [illegible] Nauk S.S.S.R. 93, [illegible] 1953. —D-labeled MePh, with D in one position, was obtained by hydrolysis of MeC_6H_4MgBr with D_2O. The product was brominated at 100-105° with illumination and the evolved HBr [illegible] by the combustion method for D [illegible] the resulting $PhCH_2Br$. The content of D in the water obtained from HBr was 0.45 % from $PhCH_2Br$ [illegible] from BzOH [illegible] after [illegible] of the [illegible] [illegible] chemically) [illegible]. Thus, it is clearly shown that an intermediate tautomer does not take part in the reaction, and MePh does not tautomerize either in the [illegible] state or during bromination. Bromination is probably a chain-radical reaction with Br atoms being initiators.

G. M. Kosolapoff

Inst. Physical. Chem. im. L.V. Pisarzhevskiy, AS UkSSR

Hydrogen regrouping in phenols. I. I. Kukhtenko. Doklady Akad. Nauk S.S.S.R. 95, 481 [illegible] [illegible]skii, et al., C.A. 44, 8882c.—D-H exchange was studied further in phenols. PhOH was equilibrated with D_2O, yielding the form enriched in $PhOD$. This was heated in sealed ampuls (quartz) at 210° and 250° after which the detn. of D in the ring was made as follows: the "regrouped" phenol was freed of hydroxyl D by soln. in 2% aq. NaOH and acidification, followed by extn. with C_6H_6, distn. and combustion for detn. of D. Several specimens were brominated to the 2,4,6-tribromo deriv. (85% yield, m. 62°), which was subjected to D detn. after combustion in the usual manner. Since the water from this combustion can contain in it any D that might enter the m-positions, the excess D found (135 and 205 γ) indicated that less than 1% of D had regrouped to the m-positions from the HO location. When the bromination was run only to the p-bromo deriv., the product (30% yield, m. 64°) on combustion yielded water with excess D of 930, 3055, and 3855 γ, which was very close to the calcd. amts., allowing for diln. by ordinary H for the 3 samples. In all expts. of sufficient duration of heating at 200° (30-200 hrs.), equil. was apparently attained but the observed extent of D rearrangement was in all cases 90-5% of the calcd. amt., which can be accounted for by deviation of the distribution coeff. of HO and DO links from unity (cf. Shatenshtein, C.A. 47, 9085b). Thus in D-H exchange in PhOH all H atoms participate equally, except for m-H atoms; in a short expt. (9 hrs.) it was found that no significant difference in the rate of reaction of o- and p-position exists. Similar treatment of o-cresol showed that D-H exchange is more rapid than in PhOH and has activating energy which is 12 kcal./mole smaller than in PhOH. All H atoms except those in the m-positions react equally.

G. M. Kosolapoff

Inst. Phys Chem. im Pisarzhevskiy AS UkSSR

KUKHTENKO, I.I.

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2 may

✓ Migration and uniform distribution of sulfur in rubber mixes. G. A. Blokh, V. Ya. Demidiona a, G. P. Miklukhin, I. I. Kukhtenko, A. F. Rekasheva, R. V. Nikulina, and M. I. Pribebyt'ko. *Legkaya Prom.* 15, No. 1, 28-30(1955). —Study was with labeled atoms. After 4-6 passes through a narrow gap between rolls, S was distributed evenly. During short contact of a raw mix with fabric at room temp., there was migration of S. There was also migration from vulcanized rubber into the raw mix. During vulcanization, migration into the fabric layer was not stopped by talc; a paper layer reduced migration.

B. Z. Kamich

(6)

Kukhtenko, I.I

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Isotope exchange of the sulfur in sodium diethyldithiocarbamate with elemental sulfur. I. I. Kukhtenko, G. A. Blokh, and G. P. Miklukhin. *Ukrain. Khim. Zhur.* 21, 227-32(1955)(in Russian).—The isotope exchange of S in NaS_2CNEt_2 with radioactive S was studied in an EtOH-toluene soln. at 50°, 60°, and 70°. The activation energy of the 1st-order reaction was approx. 22 kcal./mole. Threefold diln. of the reagents did not change the rate const. Rates increased with increasing temp. Gary Gerard

(3)

KOKHTENKO, I.I.

USSR/ Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 21/49

Authors : Kukhtenko, I. I., and Miklukhin, G. P.

Title : Isotope exchange of elementary S with sulfur of ammonium thiocyanate, thiourea and sodium diethyldithiocarbamate

Periodical : Dok. AN SSSR 100/5, 921-923, Feb 11, 1955

Abstract : The isotopic exchange of elementary S with sulfur of ammonium thiocyanate, thiourea and sodium diethylcarbamate was investigated to determine the effect of substitutes, molecular structure and S-C bond on the mobility of S. A study of the tautomeric mechanism of the exchange reaction between S and 2-mercaptobenzthiazole showed that S in C-S bonds is always capable of interchange. The activation energies and reaction temperatures of isotopic S exchange are listed. Eight references: 5 USSR and 3 USA (1924-1954). Table.

Institution : Academy of Sciences Ukr. SSR, The L. V. Pisarzhevskiy Institute of Phys. Chem

Presented by : Academician A. N. Frumkin, October 30, 195

Kukhtenko, I. I.

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Mobility of sulfur in the methyl ester of diethyldithiocarbamic acid and the nickel salt of ethylxanthic acid. I. I. Kukhtenko, L. E. Burkser, and G. P. Miklukhin. *Proc. Acad. Sci. U.S.S.R., Sect. Chem.* 106, 125-8(1956)(Engl. translation).—See *C.A.* 50, 13762*f*. B. M. R.

Chem

PM

Kukhtenko, I. I.

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Mobility of sulfur in methyl ester of diethyldithiocarbamic acid and the nickel salt of ethylxanthic acid. I. I. Kukhtenko, L. E. Burkser, and G. P. Miklukhina. *Doklady Akad. Nauk S.S.S.R.* 106, 1023-5(1956).—Heating MePh solns. of Et_2NCS_2Me and S^{35} 1-3 hrs. at 150-75° resulted in S exchange whose av. rate const. at 150° was 0.150 and at 170° was 0.915 hr.$^{-1}$ The time of half-change at 150° was 4.5 hrs., at 170°, 0.75 hrs. The activation energy was estd. at 40 kcal./mole. Only 1 S atom exchanges, probably the C:S group being involved. Similar treatment of $(EtOCS_2)_2Ni$ in expts. up to 16.5 hrs. at 139-150° showed the average rate constant of exchange to be 0.07 at 139° and 0.35 hr.$^{-1}$ at 150°; half-periods being 10 hrs. and 2 hrs., resp. Apparently all 4S atoms participate and the reaction is slower than shown by the K salt (cf. Fokin and Burkser, *C.A.* 50, 1874). G. M. Kosolapoff

Chem

KUKHTENKO, I. I.

USSR/Organic Chemistry - Theoretical and General Questions on Organic Chemistry, E-1

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 759

Author: Kukhtenko, I. I., Burkser, L. Ye., and Miklukhin, G. P.

Institution: Academy of Sciences USSR

Title: Mobility of Sulfur in the Methyl Ether of Diethyldithiocarbamic Acid and the Nickel Salt of Ethyldithiocarbonic Acid

Original Periodical: Dokl. AN SSSR, 1956, Vol 106, No 6, 1023-1026

Abstract: The isotopic exchange between elementary tagged S^{35} and the methyl ether of diethyldithiocarbamic acid (I) and nickel ethyl zanthate (II) has been investigated in toluene and benzene solution, respectively. When equimolar amounts of S^{35} and I are used in concentrations of ~0.25 M at 156°, the half life for the reaction $\tau_{\frac{1}{2}}$ is 4.5 hours; at 170°, $\tau_{\frac{1}{2}} = 0.75$ hours. The rate constant for the exchange reaction at 156° is 0.156 hours^{-1}; at 170°, $K = 0.915$ hours^{-1}. $E \approx 40$ kcal/mole. Only one of the sulfur atoms of I takes part in the reaction, presumably that from the $C = S$ group. The experiments were carried

Card 1/2

USSR/Organic Chemistry - Theoretical and General Questions on Organic Chemistry, E-1

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 759

Abstract: out in sealed ampules placed in a constant temperature bath. For the system S^{35}-II (80 mg S + 200 mg II in 20 ml benzene solution) at 139° $_{\frac{1}{2}}$ = 10 hours and at 150°, 2 hours; at 139°, K = 0.07 hours^{-1} and at 150°, 0.35 hours^{-1}. All 4 S atoms of II take place in the exchange. The recorded data show that I and II react considerably slower than the Na- and K-salts of the respective acids (Referat Zhur - Khimiya, 1956, 403). The authors explain this on the basis of a previously proposed mechanism for the exchange of the S atom of thionyl groups by a decrease in the charge on the S atom in the C = S bond in the more covalent salts of heavy metals and the ethers of the investigated acids relative to their polarized alkali metal salts; this reduction in the effective charge is brought about by the weakening of σ-π conjugation /resonance/ in the dithiocarboxylic groups of the latter group of compounds compared to the alkali metal salts of the indicated acids.

Card 2/2

KUKHTENKO, I. I.

"Synthesis of Certain Labeled Organic Compounds."

Problemy Kinetics and Catalysis, v. 9, Isotopes in Catalysis, Moscow, Izd-vo AN SSSR, 1957, 443p.

Most of the papers in this collection were presented at the Conf on Isotopes in Catalysis which took place in Moscow, Mar 31-Apr 5, 1956.

KUKHTENKO, I.I.

Synthesis of some labeled organic compounds. Probl. kin. i kat. 9: 423-429 '57. (MIRA 11:3)
(Organic compounds) (Deuterium) (Nitrogen--Isotopes)

BRODSKIY, A. I., VYSOTSKAYA, N. A., KUKHTENKO, I. I., MIKLUKHIN, G. P. (Deceased) STRIZAK, L. L. and SULIMA, L. V. (Inst. of Phys. Chem. im. L. V. Pizarzhevskiy, Acad. Sci. UK. ZZ SSR.

"Isotopic Exchange of Oxygen, Nitrogen, and Sulfur in Solutions, and Its Mechanism."
p. 20,

Isotopes and Radiation in Chemistry, Collection of papers of 2nd All-Union Sci. Tech. Conf. on Use of Radioactive and Stable Isotopes and Radiation in National Economy and Science, Moscow, Izd-vo AN SSSR, 1958, 380pp.

This volume published the reports of the Chemistry Section of the 2nd AU Sci Tech Conf on Use of Radioactive and Stable Isotopes and Radiation in Science and the National Economy, sponsored by Acad Sci USSR and Main Admin for Utilization of Atomic Energy under Council of Miniasters USSR Moscow 4-12 Apr 1957.

KUKHTENKO, I.I.

LATYSHEV, G.D.

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PHASE I BOOK EXPLOITATION SOV/5410

Tashkentskaya konferentsiya po mirnomu ispol'zovaniyu atomnoy energii, Tashkent, 1959.

Trudy (Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy) v. 2. Tashkent, Izd-vo AN UzSSR, 1960. 449 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk Uzbekskoy SSR.

Responsible Ed.: S. V. Starodubtsev, Academician, Academy of Sciences Uzbek SSR. Editorial Board: A. A. Abdullayev, Candidate of Physics and Mathematics; D. M. Abdurasulov, Doctor of Medical Sciences; U. A. Arifov, Academician, Academy of Sciences Uzbek SSR; A. A. Borodulina, Candidate of Biological Sciences; V. N. Ivashev; G. S. Ikramova; A. Ye. Kiv; Ye. M. Lobanov, Candidate of Physics and Mathematics; A. I. Nikolayev, Candidate of Medical Sciences; D. Nishanov, Candidate of Chemical Sciences; A. S. Sadykov, Corresponding Member, Academy of Sciences USSR, Academician, Academy of Sciences Uzbek SSR; Yu. N. Talanin,

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Transactions of the Tashkent (Cont.) SOV/5410

Candidate of Physics and Mathematics; Ya. Kh. Turakulov, Doctor of Biological Sciences. Ed.: R. I. Khamidov; Tech. Ed.: A. G. Babakhanova.

PURPOSE : The publication is intended for scientific workers and specialists employed in enterprises where radioactive isotopes and nuclear radiation are used for research in chemical, geological, and technological fields.

COVERAGE: This collection of 133 articles represents the second volume of the Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy. The individual articles deal with a wide range of problems in the field of nuclear radiation, including: production and chemical analysis of radioactive isotopes; investigation of the kinetics of chemical reactions by means of isotopes; application of spectral analysis for the manufacturing of radioactive preparations; radioactive methods for determining the content of elements in the rocks; and an analysis of methods for obtaining pure substances. Certain

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instruments used, such as automatic regulators, flowmeters, level gauges, and high-sensitivity gamma-relays, are described. No personalities are mentioned. References follow individual articles.

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Brodskiy, A. I., I. P. Gragerov, I. F. Franchuk, L. V. Sulima,
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Chuveleva, E. A., K. V. Chmutov, and P. P. Nazarov. [Insti-
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Novikov, A. I. [Tadzhikskiy gosudarstvennyy universitet im.
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Ampelogova, N. I. [Radiyevyy institut im. V. G. Khlopina

Card 16/20

S/081/62/000/001/004/067
B156/B101

AUTHORS: Brodskiy, A. I., Gragerov, I. P., Franchuk, I. F., Sulima, L.V., Kukhtenko, I. I., Lunenok, V. A., Fomenko, A. S., Aleksankin, M. M.

TITLE: Mechanism of oxidation reactions investigated by the isotopic method

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 60, abstract 1B439 (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, v. 2. Tashkent, AN UzSSR, 1960, 327-334)

TEXT: A review of work done by the authors on studying the mechanism of certain oxidation reactions using isotopes: the oxidation of organic compounds with chromyl chloride, the mechanism of anthranil regrouping, the process of oxidation of aniline, o-anisidine and p-nitroaniline with Caro acid. The mechanism whereby hydrogen peroxide and certain persulfate-type inorganic peroxide compounds are formed and converted is examined; so also are the kinetics of isotopic exchange in substituted benzoic acids,

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S/081/62/000/001/004/067
B156/B101

Mechanism of oxidation reactions ...

benzaldehydes, alcohols, naphthalenes and nitro compounds with H_2O^{18}. 18 references. [Abstracter's note: Complete translation.]

Card 2/2

S/020/60/132/03/33/066
B011/B008

AUTHOR: Kukhtenko, I. I.

TITLE: Investigation of the Mechanism of the Anthranil Regrouping by Means of the Oxygen Isotope O^{18}

79

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 3, pp. 609-611

TEXT: It is the purpose of the paper to clarify the problem whether the oxygen of the carboxyl-group in the anthranilic acid originates from the nitro-group of the o-nitro-toluene used or from the aqueous alkali. For this purpose the author investigated the conversion of the o-nitro-toluene into anthranilic acid, and of the potassium salt of the o-nitro-toluene-p-sulphonic acid into p-sulfo-anthranilic acid. Aqueous KOH tagged with O^{18} was used thereby. The reaction mechanism was determined from the O^{18} content of the 2 mentioned acids. The author mentions results of 2 typical experiments. It follows therefrom that one oxygen atom in the carboxyl-group of both these acids originates from the o-nitro-toluene, whilst the second atom originates from the aqueous

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Investigation of the Mechanism of the Anthranil Regrouping by Means of the Oxygen Isotope O^{18}

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alkali. This is in accordance with the reaction mechanisms proposed in Ref. 2 and by M. N. Shchukina and G. S. Predvoditeleva (Ref. 3) (1). This observation corresponds finally to one of the variants of the scheme by A. Ye. Poray-Koshits (Ref. 4). All these scientists presumed that a formation of anthranil as an intermediate occurs during the anthranil regrouping (see Scheme). The data by the author contradict the scheme by G. Lock (Ref. 1) and that variant by Poray-Koshits in which the formation of the ortho form of the acid was presumed. The author finally denies the sometimes presumed (Ref. 5) mechanism of the intra-molecular oxidation of the methyl-group by the oxygen of the nitro-group. For the purpose of confirming the mechanism (1), the author studied the hydrolysis of the anthranil to anthranilic acid with the aid of the aqueous, O^{18} containing alkali. It appeared that the acid contained 40-46% of the amount of excessive O^{18}, which was present in the aqueous alkali. This is an additional proof in favor of the regrouping mechanism of type (1). Experiments showed that by the isotope exchange of the anthranilic- and the p-sulfo-anthranilic

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Investigation of the Mechanism of the Anthranil Regrouping by Means of the Oxygen Isotope O^{18}

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acid during the reaction, their isotope composition does not suffer any significant change. An isotope exchange of the anthranil with H_2O^{18} does not take place at all at 100° . The author mentions the 3 most probable structural forms of anthranil ((I)-(III)), among which no definite choice could, however, be made so far. He stated that anthranil does not exchange its hydrogen with heavy water within 3 hours even at 100° . The amide formula (II) of Ref. 6 is thus contradicted unambiguously. Further experiments of the author contradicted the presumption of Ref. 7 and also the structure (III). The structure (I) of anthranil (Refs. 3,8) is thus the most probable one. The author thanks A. I. Brodskiy, Academician of the AS UkrSSSR for conducting the work. There are 10 references, 5 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii im. L. V. Pisarzhevskogo Akademii nauk USSR (Institute of Physical Chemistry imeni L. V. Pisarzhevskiy of the Academy of Sciences, UkrSSR)

Card 3/4

Investigation of the Mechanism of the Anthranil Regrouping by Means of the Oxygen Isotope O^{18}

S/020/60/132/03/33/066
B011/B008

PRESENTED: January 20, 1960, by B. A. Kazanskiy, Academician ✓

SUBMITTED: July 10, 1959

Card 4/4

KUKHTENKO, O.I.

Problem concerning the classification of automatic systems according to principle of control. Avtomatyka 7 no.6:69-82 '62.
(MIRA 16:1)

(Automatic control)

SHLYK, A.A.; GAPONENKO, V.I.; KUKHTENKO, T.V.

Spectral properties and nature of chlorophyll a'. Dokl.AN BSSR 4 no.9:393-397 S '60. (MIRA 13:9)

1. Laboratoriya biofiziki i izotopov AN BSSR. Predstavleno akad. AN BSSR T.N. Godnevym.
(Chlorophyll)

SHLYK, A.A.; GAPONENKO, V.I.; KUKHTENKO, T.V.

Chlorophyll renewal in the absence of growth. Biul. Inst. biol. AN BSSR no.5:131-137 '60. (MIRA 14:7)
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SHLYK, A.A.; GAPONENKO, V.I.; PRUDNIKOVA, I.V.; KUKHTENKO, T.V.; LYAKHNOVICH,
Ya.P.; KALER, V.L.

Comparative study of the renewal of chlorophyll in different parts of the plant. Fiziol. rast. 7 no.6:625-637 '60. (MIRA 14:1)

1. Laboratory of Biophysics and Isotopes, Byelorussian S.S.R. Academy of Sciences, Minsk.

(Chlorophyll)

SHLYK, A.A.; MASHENKOV, V.A. [Mashankou, V.A.]; NIKOLAYEVA, G.N. [Nikalaeva, H.N.]; PRIDNIKOVA, I.V. [Prudnikava, I.V.]; KUKHTENKO, T.V. [Kukhtsenka, T.V.]

Investigating the reaction of alkaline splitting of chlorophyll method of studying the localization of tagged carbon. Vestsi AN BSSR. Ser. biial. nav. no.3:37-46 '61. (MIRA 14:10)
(CHLOROPHYLL)

SHLYK, A.A.; KUKHTENKO, T.V.

Kinetics of the specific activity of carbon contained in phytol and phorbin of chlorophylls a and b during the process of renewal. Fiziol.rast. 8 no.5:526-535 '61. (MIRA 14:10)

1. Biophysics and Isotopes Laboratory of Byelorussian Academy of Sciences, Minsk.

(Chlorophyll)

SHLYK, A.A.; GAPONENKO, V.I.; KUKHTENKO, T.V.

The determining role of complete synthesis and breakdown of the molecule in the renewal of chlorophyll. Dokl. AN BSSR 6 no.3: 189-192 Mr '62. (MIRA 15:3)

1. Laboratoriya biofiziki i izotopov AN BSSR. Predstavleno akademikom AN BSSR T.N.Godnevym.

(CHLOROPHYLL)

SHLYK, A.A.; GAPONENKO, V.I.; KUKHTENKO, T.V.

Kinetics of C^{14} during the renewal of chlorophyll in barley and tobacco plants. Fiziol. rast. 9 no.5:521-533 '62. (MIRA 15:10)

1. Laboratory of Biophysics and Isotopes, Byelorussian S.S.R. Academy of Sciences, Minsk.
(Chlorophyll) (Carbon—Isotopes)

SHLYK, A.A.; MIKHAYLOVA, S.A.; GAPONENKO, V.I.; KUKHTENKO, T.V.

Investigation of biosynthetic interrelations between chlorophyl a and b in Chlorella. Fiziol. rast. 10 no.3:275-287 My-Je '63. (MIRA 16:6)

1. Laboratory of Biophysics and Isotopes, B.S.S.R. Academy of Sciences, Minsk.

(Chlorophyll) (Algae)